

## **REMARKS/ARGUMENTS**

Reconsideration of the above-identified application, as herein amended and in view of the following remarks, is respectfully requested.

### **Status of Claims**

Claims 1-26 are pending in the application, with claim 1 being the only independent claim. Claim 1 has been amended. No new matter has been added.

### **Overview of the Office Action**

Claims 1-7, 22 and 23 stand rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,693,352 (*Huang*).

Claims 8, 9 and 24 stand rejected under 35 U.S.C. §103(a) as unpatentable over *Huang* in view of U.S. Patent No. 5,717,226 (*Lee*).

Claims 10-13, 25 and 26 stand rejected under 35 U.S.C. §103(a) as unpatentable over *Huang* in view of U.S. Patent No. 6,346,719 (*Udagawa I*).

Claims 14-21 stand rejected under 35 U.S.C. §103(a) as unpatentable over *Huang* in view of JP 2001036131 (*Udagawa II*).

SPECIAL NOTE: During a June 29, 2007 telephone conference with applicants' attorney, Douglas D. Zhang, the Examiner confirmed that this Office Action is a non-final Office Action.

## **Summary of Subject Matter Disclosed in the Specification**

The following descriptive details are based on the specification. They are provided only for the convenience of the Examiner as part of the discussion presented herein, and are not intended to argue limitations which are unclaimed.

The specification discloses a light-emitting diode chip having an epitaxial semiconductor layer sequence with an active zone that emits electromagnetic radiation, and an electrical contact structure. The electrical contact structure comprises a radiation-transmissive electrical current expansion layer which contains ZnO and has a front side surface facing away from the semiconductor layer sequence, and an electrical connection layer. The current expansion layer is applied directly on a cladding layer of the semiconductor layer sequence on which the connection layer is also applied directly (*see* Figs. 1 and 2 and paragraphs [0007], [0035] and [0037] of the specification). The cladding layer is p-doped (*see* paragraphs [0015] and [0034] of the specification).

The connection layer is electrically conductively connected to the current expansion layer and has a junction with the cladding layer. However, the connection layer does not cover (*see* Fig. 1) or only partly covers (*see* Fig. 2) the front side surface of the current expansion layer. When an electrical voltage is applied to the light-emitting diode chip in the operating direction, the junction between the connection layer and the cladding layer is not electrically conductive or is only poorly electrically conductive so that the entire, or virtually the entire, current flows via the current expansion layer into the semiconductor layer sequence, rather than directly from the connection layer to the cladding layer to which the connection layer is directly applied. *See* Figs. 1 and 2 and paragraphs [0007], [0040] and [0044] of the specification.

During operation, as a result of this structure, no current, or at least less current, is injected into the region directly below the connection layer. Therefore, no light, or at least less

light, is generated in this region and absorbed by the connection layer (*see* paragraph [0008] of the specification).

## **Allowability of the Claims**

### **Independent Claim 1**

Independent claim 1 has been amended to recite that the connection layer does not cover or only partly covers the front side surface of the current expansion layer. Support for this amendment can be found, for example, in Figs. 1 and 2 and paragraphs [0040] and [0044] of the specification.

Amended claim 1 now recites, *inter alia*, the following:

“wherein the current expansion layer is applied directly on a cladding layer of the semiconductor layer sequence and comprises a window, in which the connection layer is applied directly on said cladding layer of the semiconductor layer sequence, and said cladding layer is p-doped,

wherein the connection layer is electrically conductively connected to the current expansion layer, and does not cover or only partly covers the front side surface of the current expansion layer” (emphasis added).

Applicants submit that amended claim 1 is not anticipated by *Huang* because *Huang* fails to disclose, either expressly or inherently, each and every element set forth in amended claim 1. In particular, *Huang* fails to disclose, teach or suggest the above-highlighted limitations of amended claim 1.

*Huang* relates to a contact structure for group III-V and group II-VI compound semiconductor devices that are generally used as light emitting diodes, laser diodes or photodiodes (*see* the Abstract of *Huang*). The Examiner refers to Fig. 7 of *Huang*, and contends that claim 1 reads on the embodiment shown in Fig. 7 of *Huang*. More particularly, the Examiner contends that the conduction layer 36A of *Huang* constitutes a current expansion layer while the transparent conducting oxide layer 37A of *Huang* constitutes a connection layer.

Applicants respectfully disagree.

According to *Huang*'s explicit teaching, the conduction layer 36A and the transparent conducting oxide layer 37A "together act as a current spreading layer" (*see* col. 10, lines 54 and 55 of *Huang*). A separate, dedicated connection layer (i.e., the contact pad 38A) is provided for the current spreading layer (*see* Fig. 7 and col. 10, lines 49-51 of *Huang*). Thus, the Examiner's selective interpretation of only one part (i.e., the conduction layer 36A) -- and not the other part (i.e., the transparent conducting oxide layer 37A) -- of the two-part current spreading layer of *Huang* as Applicants' recited a current expansion layer is in direct contradiction to the express and explicit teaching of *Huang*. As noted above and as clearly illustrated in Fig. 7 of *Huang*, the current spreading layer of *Huang* does not as a whole have a window, in which the contact pad 38A is applied directly on the p<sup>+</sup>-type layer 35. *Huang* therefore fails to disclose or teach the limitations "wherein the current expansion layer is applied directly on a cladding layer of the semiconductor layer sequence and comprises a window, in which the connection layer is applied directly on said cladding layer of the semiconductor layer sequence, and said cladding layer is p-doped" of amended claim 1.

In addition, Applicants point out that in *Huang*, the transparent conducting oxide layer 37A completely covers the conduction layer 36A. Therefore, even were it permitted *arguendo* to interpret the transparent conducting oxide layer 37A of *Huang* as part of the connection layer, rather than a part of the current spreading layer as *Huang* expressly explains, *Huang* would still fail to anticipate amended claim 1 because, even then, *Huang* would fail to disclose or teach the limitations "wherein the connection layer is electrically conductively connected to the current expansion layer, and does not cover or only partly covers the front side surface of the current expansion layer" of amended claim 1 (emphasis added).

In view of these notable differences between Applicants' claimed invention and the teachings of *Huang*, withdrawal of the §102(e) rejection of claim 1 is respectfully deemed appropriate.

Moreover, applicants further submit that the above-discussed fundamental differences between amended claim 1 and *Huang* clearly and patentably distinguish amended claim 1 thereover under 35 U.S.C. 103(a) and none of the additional cited art teaches what is missing from *Huang* in the same context.

#### Dependent Claims 2-26

Claims 2-26 depend, either directly or indirectly, from independent claim 1 and, as such, each is respectfully deemed to be allowable therewith.

In addition, these claims include features which serve to still further distinguish the claimed subject matter over the prior art of record.

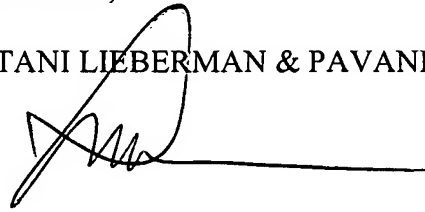
**Conclusion**

Based on all of the above, applicants submit that the present application is now in full and proper condition for allowance. Prompt and favorable action to this effect, and early passage of the application to issue, are respectfully solicited.

Should the Examiner have any comments, questions, suggestions or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate an early resolution of any outstanding issues.

Respectfully submitted,

COHEN PONTANI LIEBERMAN & PAVANE LLP

A handwritten signature in black ink, appearing to be 'Lance J. Lieberman', written over a horizontal line.

By

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